Pictures to: 4. IBM T.J. Watson Research Center

4.1 TEM of Silicon - Silicide Interfaces Publication 42

- What follows arerthe pictures to publication 42 (*Transmission electron microscopy of the formation of nickel silicides*.).
  - Once more, some pictures (FIgs. 12 and 14 in the paper) show the very first high-resolution images of a heterogeneousa interface. No matter what the publication dfate; these "firsts here and in publication 1 were taken around the same time.

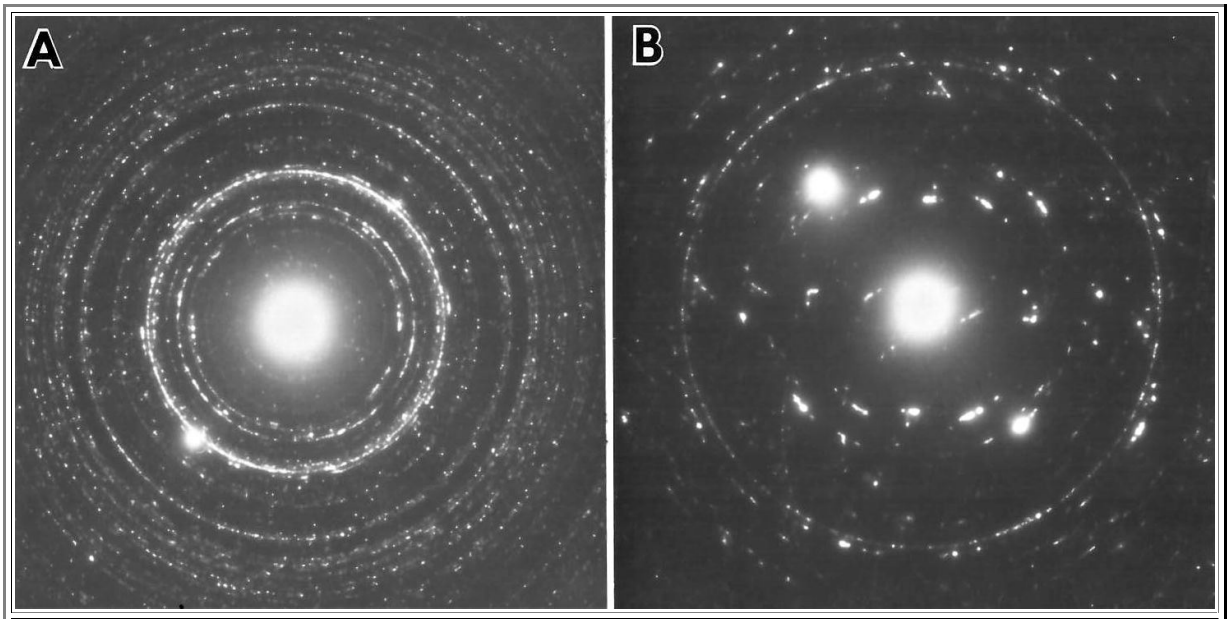


Fig. 1 In Publication 2

Fig. l Diffraction patterns of (a) Ni2Si present after the 300°C annealing and of (b) NiSipresent after the 400°C annealing.

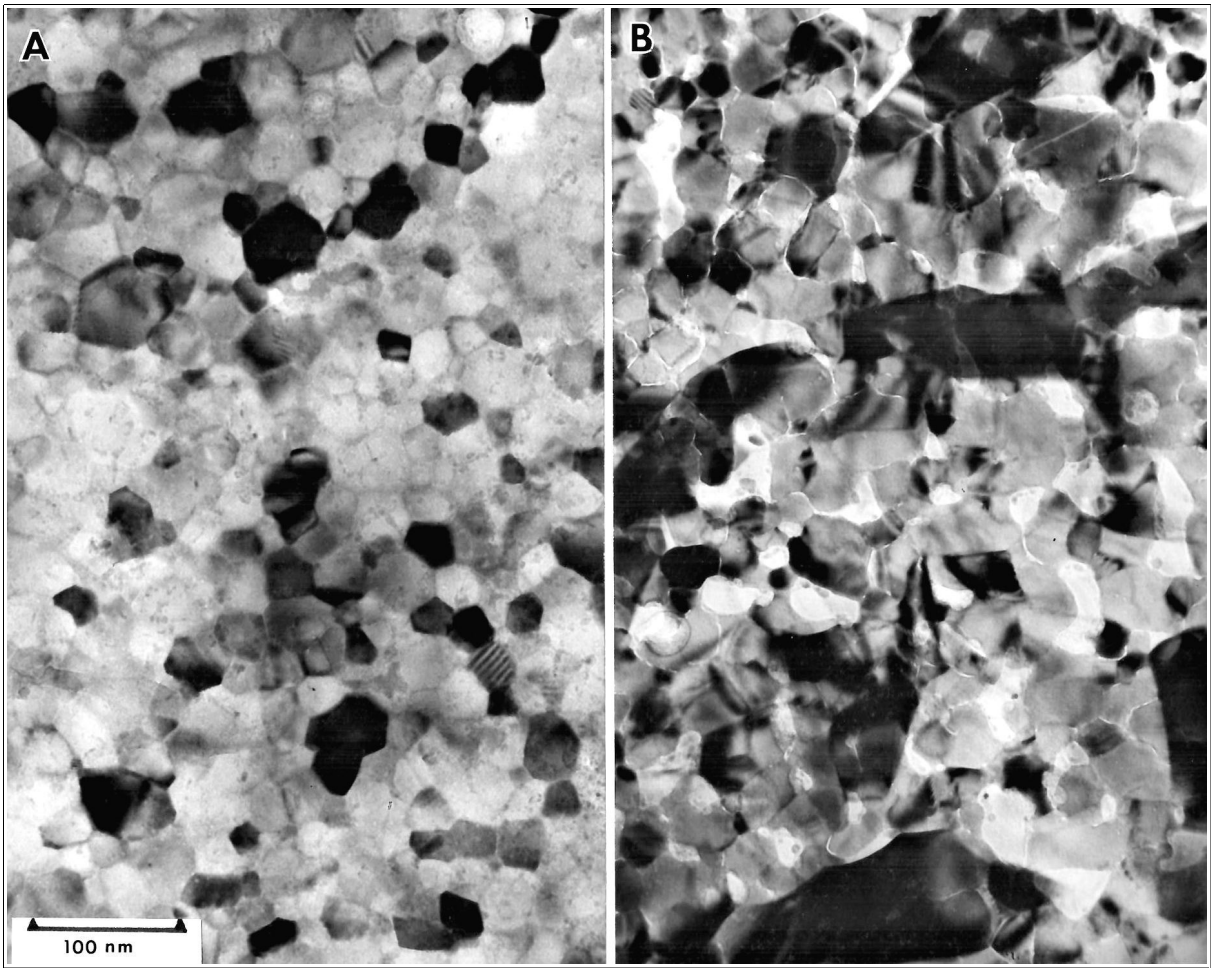


Fig. 2 In Publication 2

Fig. 2 Silieide layers on {100} Si (a) after the 300°C annealing and (b) after the 400°Cannealing.

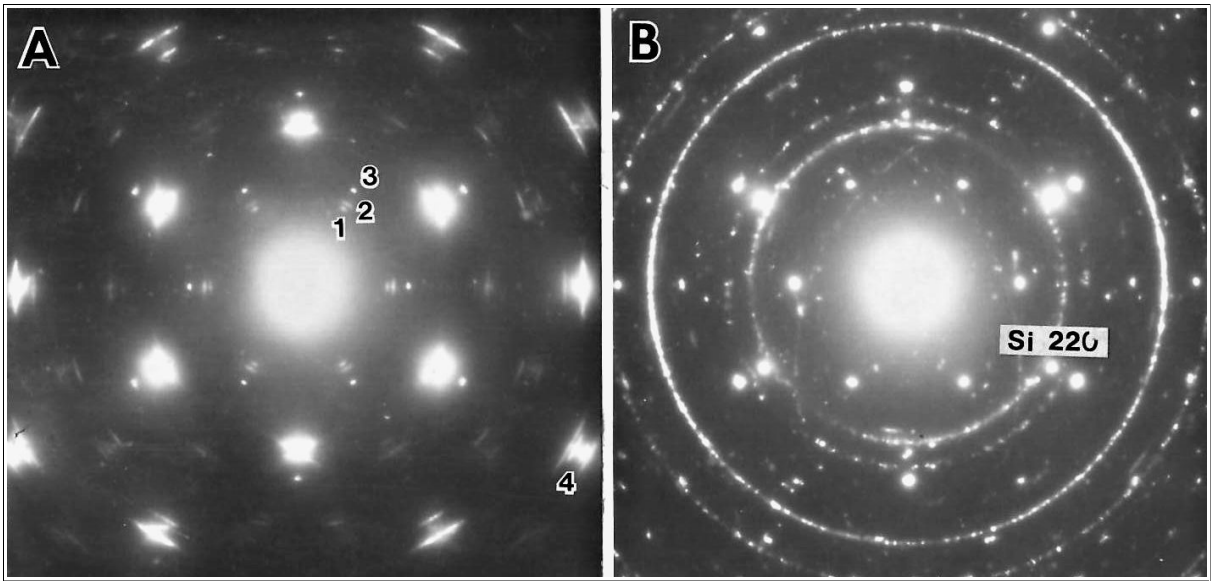
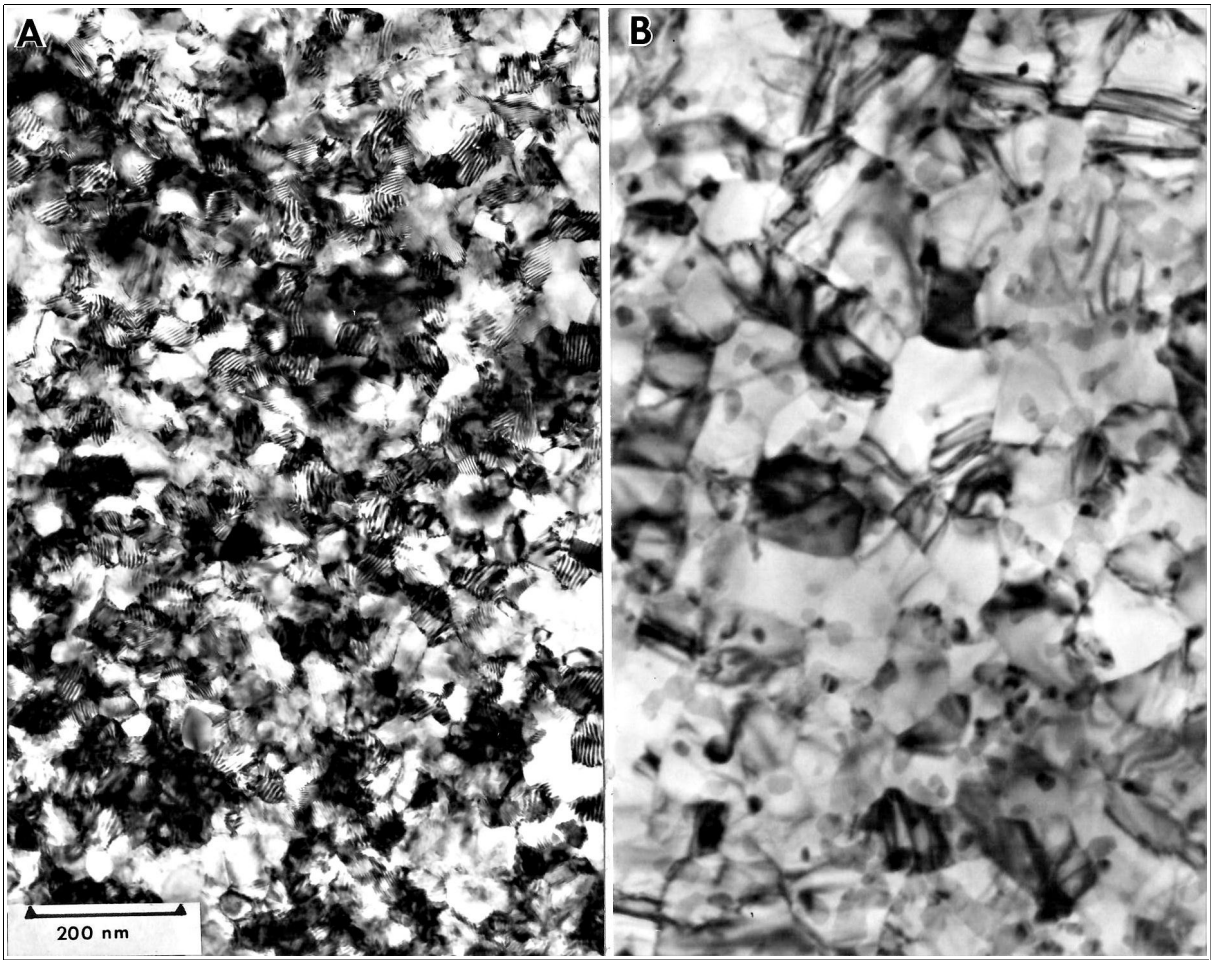


Fig. 3 In Publication 2

Fig.3 Diffraction pattern of
(a) epitaxial Ni2Si and NiSi present on {l11} Si after the 300°C annealing and of
(b) epitaxial and polycrystalline NiSi after the 400°C annealingFor details see the text.



. **Fig. 6 In Publication 2**

Fig.6 Silicide layers on {1ll} Si (a) after the 300^{o}C annealing and (b) after the 400^{0}Cannealing

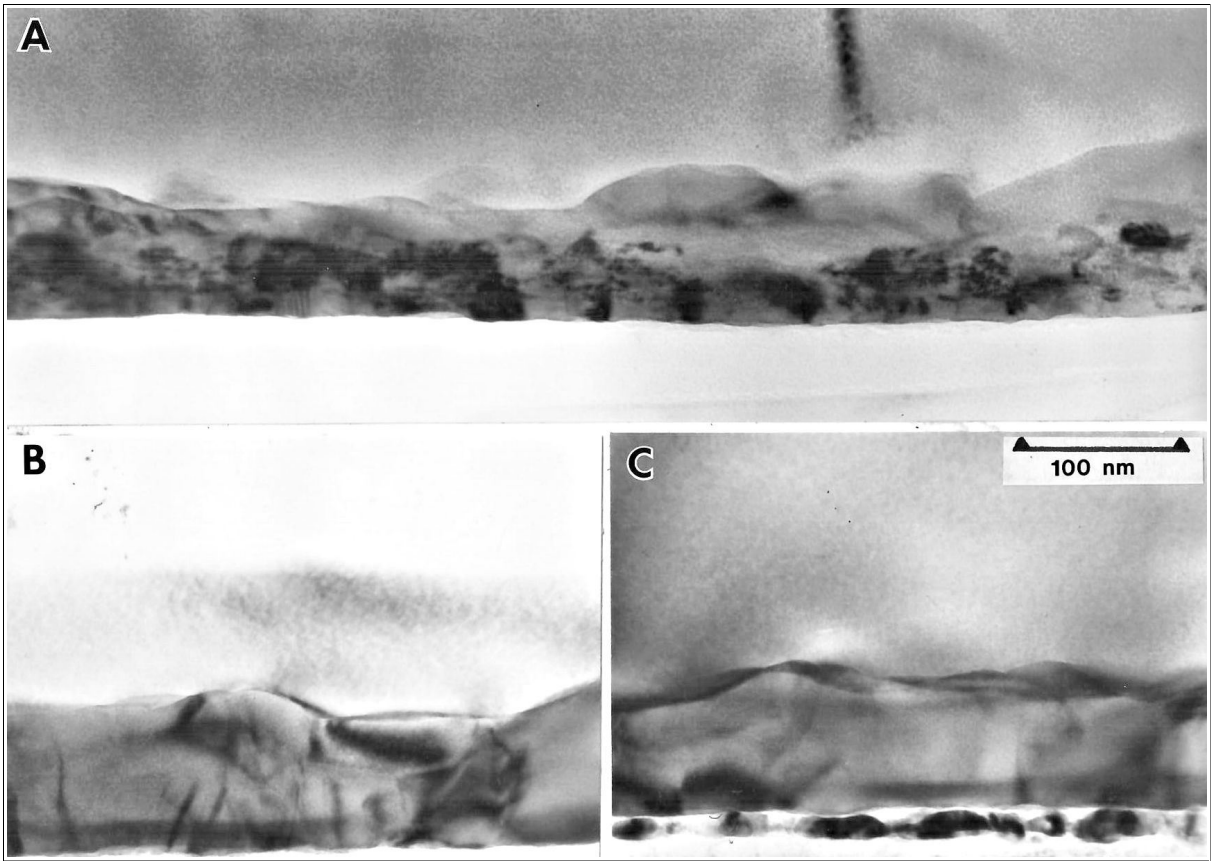


Fig. 7 In Publication 2

Fig. 7 Cross-sectional view of (a) Ni_2Si on {l00} Si after the 300°C annealing and of (b) NiSi and Ni_2Si after the 400°0 annealing. For details see the text

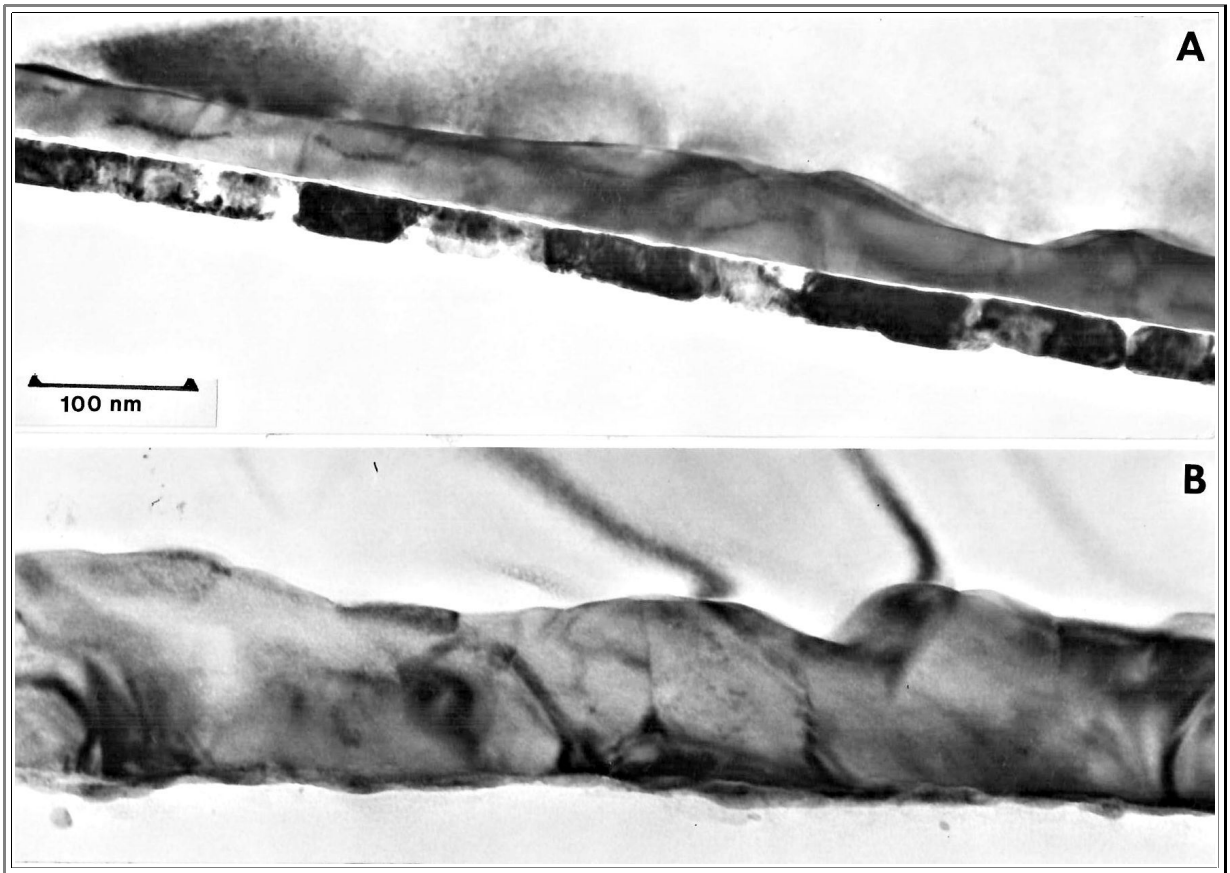


Fig. 8 In Publication 2.

Fig.8 C ross-seetional view of (a) Ni_2Si and NiSi after the 300°0 annealing and of (b) NiSi after the 400 0C annealing

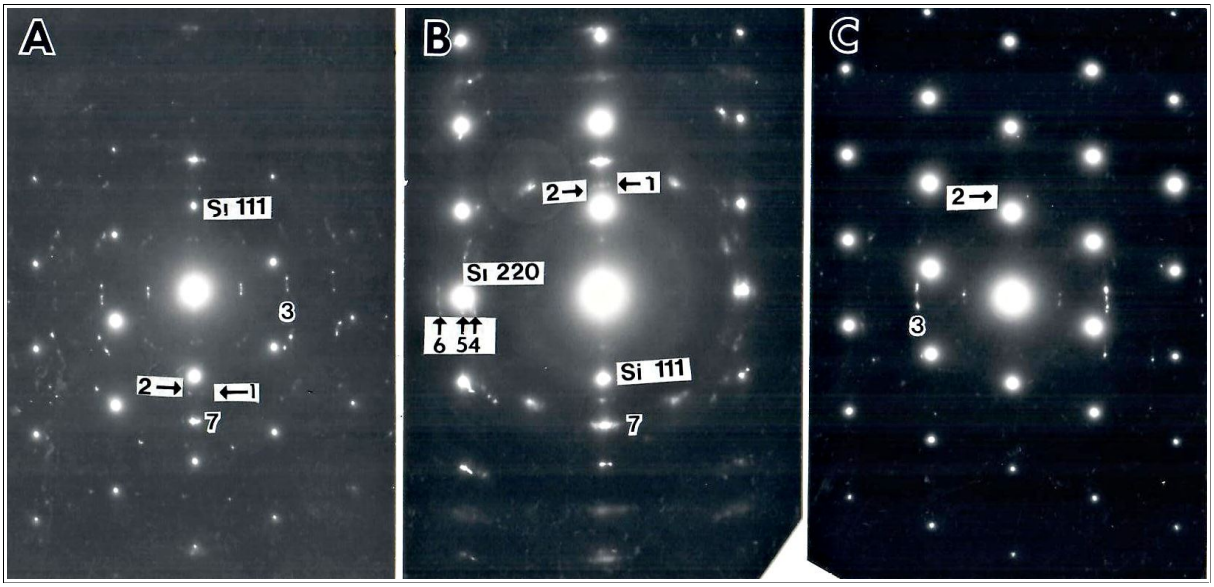


Fig. 9 In Publication 2

Fig.9 Diffraction patterns from cross-sectional specimens. (a) and (b) show thc diffractionpattern of epitaxial Ni2Si and NiSi on {lll} Si for (a) {ll0} and (b) {ll2}specimen orientation. (c) shows thc diffraction pattern of epitaxial NiSiafter the 400°0 annealing for {II0} specimen orientation. For details see thetext

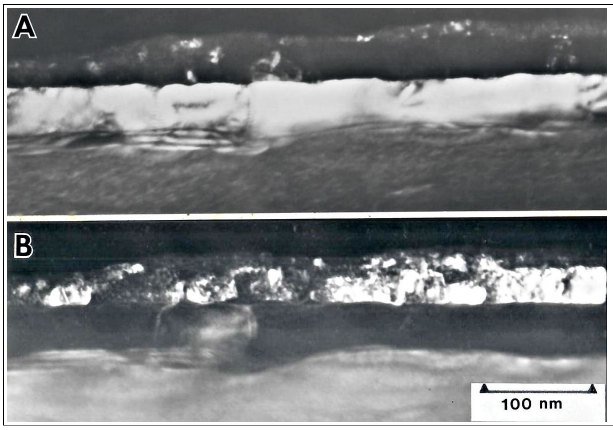


Fig. 11 In Publication 3.

Fig. 11 Dark-field images of the Ni2Si and NiSi on {l11} Si after the 300°C anneal.
(a) wastaken with a NiSi reflection (spot no. 3 in fig. 9 (a)) and
(b) was taken with aNi2Si reflection (spot no. 7 in fig. 9 (a)). ,

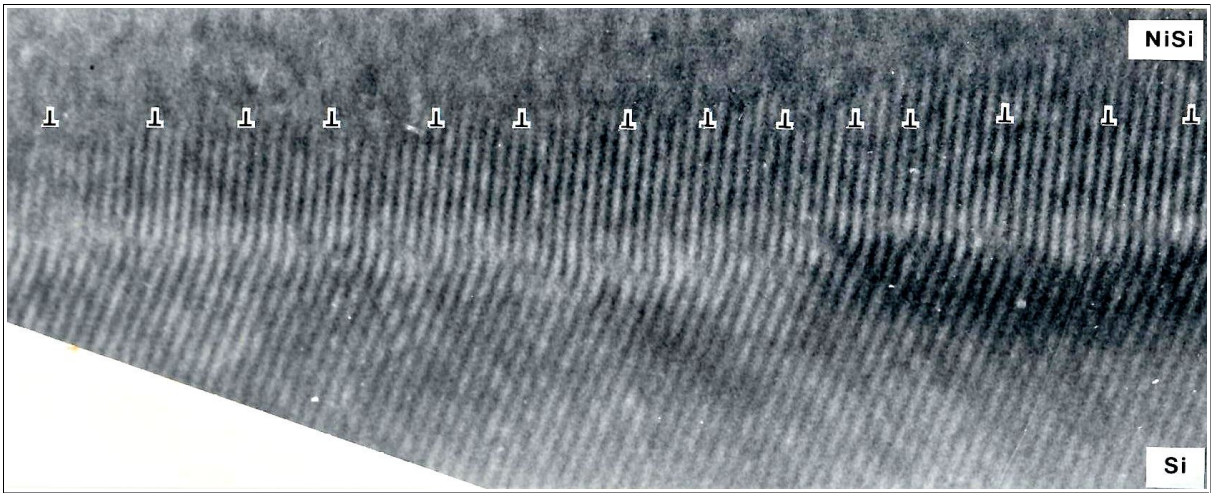


Fig. 12 In Publication 2

Fig. 12 Lattice fringe image of the epitaxial NiSi-Si interface. The dislocation symbolsdenote ending NiSi {l-I00} fringes.

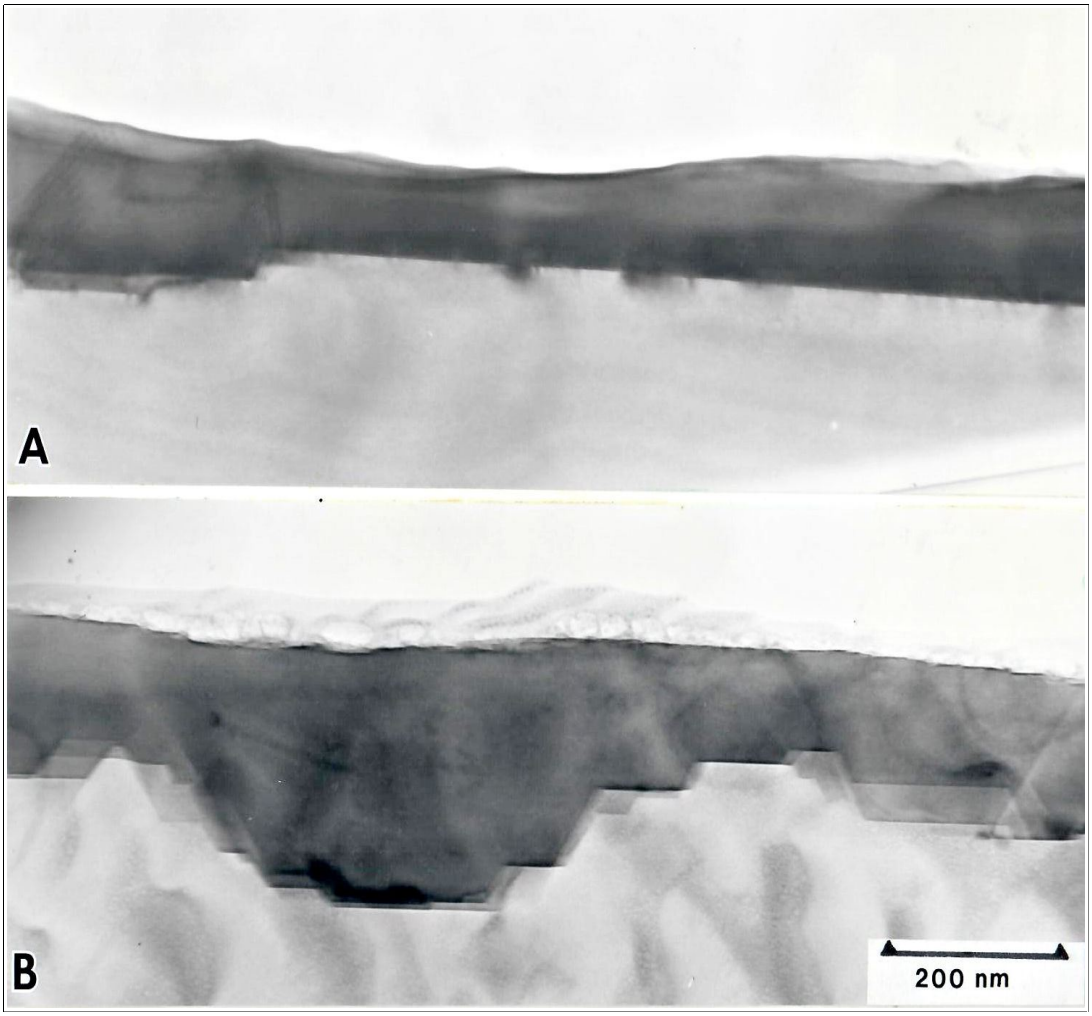


Fig. 13 In Publication 2.

Fig. 13 Cross-sectional view of $NiSi_2$ present after the 800 ^{0}C anneal OII (a) {l11} Si and on(b) {l00} Si.

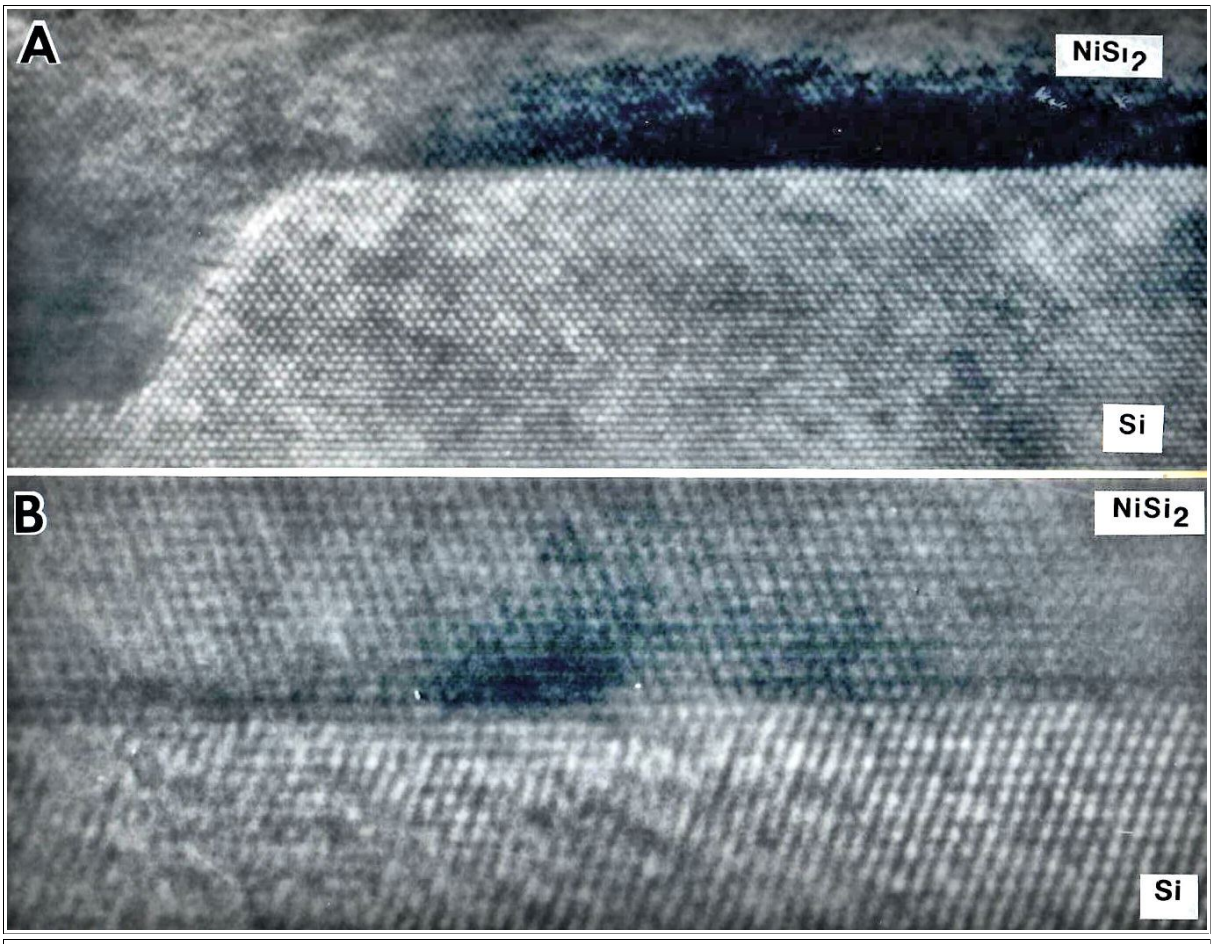


Fig. 14 In Publication 2

Fig.14 Lattice images of NiSi2-Si interfaces. (a) shows NiSi2 on {l00} Si; a large faceeton a {l00} plane and a small faceet on a {lll} plane is visible. (b) shows NiSi2on {lll} Si; the NiSi2 is twinned with respect to the Si matrix

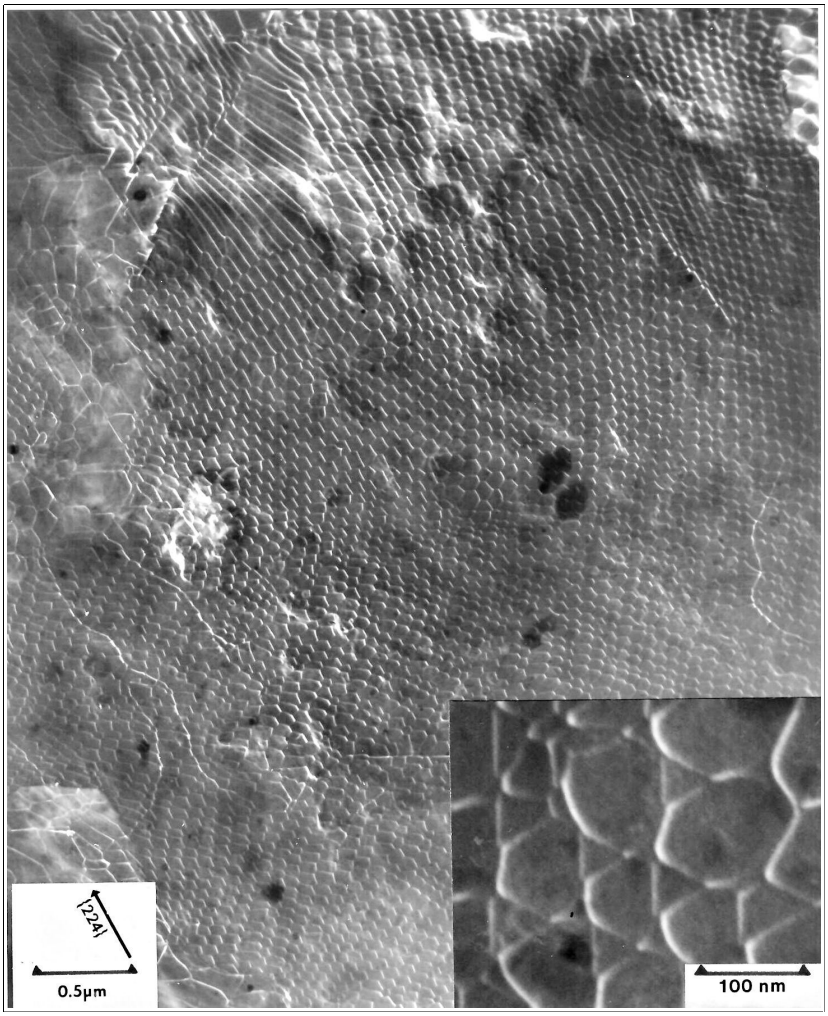


Fig. 15 In Publication 2.

Fig. 15 Weak-beam image of the misfit dislocation network in the NiSi 2-Si interface for{lll} oriented substrates. The inset shows an enlarged view of the dislocationnetwork in the area with non-twinned NiSi2 . For details see the text.